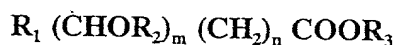


We claim:

1. A composition comprising (A) an acceptable vehicle or base and (B) at least one compound selected from the group consisting of oligosaccharaide aldonic acids and related compounds, and isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, and straight or branched chain, or cyclic forms thereof,

wherein said oligosaccharide aldonic acid has the formula:



wherein,

$R_1$  and  $R_3$  are independently H or an alkyl, aralkyl or aryl group of saturated or unsaturated, straight or branched chain or cyclic form, having from 1 to 25 carbon atoms;

$m$  is 2, 3, 4, 5, 6, 7, 8, 9, 10 or 11;

$n$  is 0, 1, 2, 3, 4, 5, 6, 7, 8, or 9;

$R_2$  is independently selected from the group consisting of H and any carbohydrate having 1 to 9 monomers, wherein at least one  $R_2$  is a carbohydrate;

H attached to carbon atom is optionally substituted by I, F, Cl, Br,  $NH_2$ ,  $NHCOCH_3$ , SH, or an alkyl, alkoxyl, aralkyl or aryl group of saturated or unsaturated, straight or branched chain or cyclic form, having 1 to 9 carbon atoms;

$R_1$ ,  $R_2$ ,  $OR_2$  or H optionally carry or are optionally substituted with CHO, COOH, sulfate, phosphate, nitrate, or a lower alkoxyl having 1 to 5 carbon atoms; and

H of the OH group is optionally substituted by an acyl group having from 2 to 25 carbon atoms,

and wherein said oligosaccharide aldonic acid is not lactobionic acid.

2. The composition of claim 1, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof contains from 2 to 6 carbohydrate monomers.

3. The composition of claim 1, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof contains from 2 to 3 carbohydrate monomers.

4. The composition of claim 1, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof contains 2 carbohydrate monomers.

5. The composition of claim 1, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of lactobionolactone, maltobionolactone, isomaltobionolactone, cellobionolactone, chitobionolactone, gentiobionolactone, glucobionolactone, galactobionolactone, mannobionolactone, ribobionolactone, kojibionolactone, xylobionolactone, arabinobionolactone, nigerobionolactone, laminarabinobionolactone, maltotrionolactone, isomaltotrionolactone, chitotrionolactone, cellotrionolactone, gentiotrionolactone, maltotetraonolactone, cellotetraonolactone, and chitotetraonolactone.

6. The composition of claim 1, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of glycerbionic acids, erythrobionic acids, threobionic acids, ribobionic acids, arabinobionic acids, xylobionic acids, lyxobionic acids, allobionic acids, altrobionic acids, glucobionic acids, mannobionic acids, gulobionic acids, idobionic acids, galactobionic acids, talobionic acids, alloheptobionic acids, altroheptobionic acids, glucoheptobionic acids, mannoheptobionic acids, guloheptobionic acids, idoheptobionic acids, galactoheptobionic acids, taloheptobionic acids, chitobionic acids, hyalobiouronic acids, hyalourobionic acids, chondrosines, chondrosinbionic acids, cellobiouronic acids, and cellourobionic acids.

7. The composition of claim 6, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, salt, ester, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of isolactobionic acid, maltobionic acid, isomaltobionic acid, cellobionic acid, gentiobionic acid, laminarabionic acid, melibionic acid, nigerobionic acid, rutinobionic acid, sophorobionic acid, and kojibionic acid.

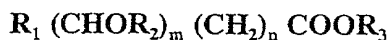
8. The composition of claim 1, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of glycertrionic acids, erythrotrionic acids, threottrionic acids, ribottrionic acids, arabinottrionic acids, xylotrionic acids, lyxottrionic acids, allottrionic acids, altrottrionic acids, glucottrionic acids, mannottrionic acids, gulottrionic acids, idottrionic acids, galactottrionic acids,

talotronic acids, alloheptotronic acids, altoheptotronic acids, glucoheptotronic acids, mannoheptotronic acids, guloheptotronic acids, idoheptotronic acids, galactoheptotronic acids, taloheptotronic acids, chitotronic acids, hyalotriouronic acids, hyalourotronic acids, chondrosintronic acids, cellotriouronic acids and cellourotronic acids.

9. The composition of claim 1, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of aldotetraonic acids, aldopentaonic acids, aldohexaonic acids, aldoheptaonic acids, aldooctaonic acids, aldononaonic acids, and aldodecaonic acids.

10. A method for treating or preventing cosmetic conditions or dermatological disorders, comprising topically applying a composition comprising (A) a topically acceptable vehicle or base and (B) at least one compound selected from the group consisting of oligosaccharaide aldonic acids and related compounds, and isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, and straight or branched chain, or cyclic forms thereof,

wherein said oligosaccharide aldonic acid has the formula:



wherein,

$R_1$  and  $R_3$  are independently H or an alkyl, aralkyl or aryl group of saturated or unsaturated, straight or branched chain or cyclic form, having from 1 to 25 carbon atoms;

$m$  is 2, 3, 4, 5, 6, 7, 8, 9, 10 or 11;

$n$  is 0, 1, 2, 3, 4, 5, 6, 7, 8, or 9;

$R_2$  is independently selected from the group consisting of H and any carbohydrate having 1 to 9 monomers, wherein at least one  $R_2$  is a carbohydrate;

H attached to carbon atom is optionally substituted by I, F, Cl, Br,  $NH_2$ ,  $NHCOCH_3$ , SH, or an alkyl, alkoxyl, aralkyl or aryl group of saturated or unsaturated, straight or branched chain or cyclic form, having 1 to 9 carbon atoms;

$R_1$ ,  $R_2$ ,  $OR_2$  or H optionally carry or are optionally substituted with CHO, COOH, sulfate, phosphate, nitrate, or a lower alkoxyl having 1 to 5 carbon atoms; and

H of the OH group is optionally substituted by an acyl group having from 2 to 25 carbon atoms,

and wherein said oligosaccharide aldonic acid is not lactobionic acid.

11. The method of claim 10, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof contains from 2 to 6 carbohydrate monomers.

12. The method of claim 10, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof contains from 2 to 3 carbohydrate monomers.

13. The method of claim 10, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof contains 2 carbohydrate monomers.

14. The method of claim 10, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of lactobionolactone, maltobionolactone, isomaltobionolactone, cellobionolactone, chitobionolactone, gentiobionolactone, glucobionolactone, galactobionolactone, mannobionolactone, ribobionolactone, kojibionolactone, xylobionolactone, arabinobionolactone, nigerobionolactone, laminarabinobionolactone, maltotrionolactone, isomaltotrionolactone, chitotrionolactone, cellotrionolactone, gentiotrionolactone, maltotetraonolactone, cellotetraonolactone, and chitotetraonolactone.

15. The method of claim 10, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of glycerbionic acids, erythrobionic acids, threobionic acids, ribobionic acids, arabinobionic acids, xylobionic acids, lyxobionic acids, allobionic acids, altrobionic acids, glucobionic acids, mannobionic acids, gulobionic acids, idobionic acids, galactobionic acids, talobionic acids, alloheptobionic acids, altoheptobionic acids, glucoheptobionic acids, mannoheptobionic acids, guloheptobionic acids, idoheptobionic acids, galactoheptobionic acids, taloheptobionic acids, chitobionic acids, hyalobiouronic acids, hyalourobionic acids, chondrosines, chondrosinbionic acids, cellobiouronic acids, and cellourobionic acids.

16. The method of claim 15, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of isolactobionic acid,

maltobionic acid, isomaltobionic acid, cellobionic acid, gentiobionic acid, laminarabionic acid, melibionic acid, nigerobionic acid, rutinobionic acid, sophorobionic acid, and kojibionic acid.

17. The method of claim 10, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of glycertrionic acids, erythrotrionic acids, threottrionic acids, ribottrionic acids, arabinottrionic acids, xylotrionic acids, lyxottrionic acids, allottrionic acids, altrottrionic acids, glucottrionic acids, mannottrionic acids, gulottrionic acids, idottrionic acids, galactottrionic acids, talottrionic acids, alloheptottrionic acids, althroheptottrionic acids, glucoheptottrionic acids, mannoheptottrionic acids, guloheptottrionic acids, idoheptottrionic acids, galactoheptottrionic acids, taloheptottrionic acids, chitottrionic acids, hyalotriouronic acids, hyalourotrionic acids, chondrosintrionic acids, cellotriouronic acids and cellourotrionic acids.

18. The method of claim 10, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of aldotetraonic acids, aldopentaonic acids, aldohexaonic acids, aldoheptaonic acids, aldooctaonic acids, aldononaonic acids, and aldodecaonic acids.

19. The method of claim 10, wherein said cosmetic conditions or dermatological disorders are selected from the group consisting of disturbed keratinization, defective syntheses of dermal components, and changes associated with aging of skin, nail and hair; and those indications which include dryness or

loose of skin, nail and hair; xerosis; ichthyosis; palmar and plantar hyperkeratoses; uneven and rough surface of skin, nail and hair; dandruff; Darier's disease; lichen simplex chronicus; keratoses; acne; pseudofolliculitis barbae; eczema; psoriasis; itchy scalp and skin; pruritus; warts; herpes; age spots; lentigines; melasmas; blemished skin; hyperkeratoses; hyperpigmented skin; abnormal or diminished syntheses of collagen, glycosaminoglycans, proteoglycans and elastin as well as diminished levels of such components in the dermis; stretch marks; skin lines; fine lines; wrinkles; thinning of skin, nail plate and hair; skin thickening due to elastosis of photoaging, loss or reduction of skin, nail and hair resiliency, elasticity and recoilability; lack of skin, nail and hair lubricants and luster; dull and older-looking skin, nail and hair; and fragility and splitting of nail and hair.

20. The composition of claim 1, further comprising a cosmetic, pharmaceutical, or other topical agent.

21. The composition of claim 20, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof contains from 2 to 6 carbohydrate monomers.

22. The composition of claim 20, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof contains from 2 to 3 carbohydrate monomers.

23. The composition of claim 20, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial



salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof contains 2 carbohydrate monomers.

24. The composition of claim 20, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of lactobionolactone, maltobionolactone, isomaltobionolactone, cellobionolactone, chitobionolactone, gentiobionolactone, glucobionolactone, galactobionolactone, mannobionolactone, ribobionolactone, kojibionolactone, xylobionolactone, arabinobionolactone, nigerobionolactone, laminarabinobionolactone, maltotrionolactone, isomaltotrionolactone, chitotrionolactone, cellotrionolactone, gentiotrionolactone, maltotetraonolactone, cellotetraonolactone, and chitotetraonolactone.

25. The composition of claim 20, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of glycerbionic acids, erythrobionic acids, threobionic acids, ribobionic acids, arabinobionic acids, xylobionic acids, lyxobionic acids, allobionic acids, altrobionic acids, glucobionic acids, mannobionic acids, gulobionic acids, idobionic acids, galactobionic acids, talobionic acids, alloheptobionic acids, altoheptobionic acids, glucoheptobionic acids, mannoheptobionic acids, guloheptobionic acids, idoheptobionic acids, galactoheptobionic acids, taloheptobionic acids, chitobionic acids, hyalobiouronic acids, hyalourobionic acids, chondrosines, chondrosinbionic acids, cellobiouronic acids, and cellourobionic acids.

26. The composition of claim 25, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of isolactobionic acid, maltobionic acid, isomaltobionic acid, cellobionic acid, gentiobionic acid, laminarabionic acid, melibionic acid, nigerobionic acid, rutinobionic acid, sophorobionic acid, and kojibionic acid.

27. The composition of claim 20, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of glycertrionic acids, erythrotrionic acids, threottrionic acids, ribottrionic acids, arabinottrionic acids, xylotrionic acids, lyxottrionic acids, allottrionic acids, altrottrionic acids, glucottrionic acids, mannottrionic acids, gulottrionic acids, idottrionic acids, galactottrionic acids, talottrionic acids, alloheptottrionic acids, altroheptottrionic acids, glucoheptottrionic acids, mannoheptottrionic acids, guloheptottrionic acids, idoheptottrionic acids, galactoheptottrionic acids, taloheptottrionic acids, chitottrionic acids, hyalotriouronic acids, hyalourotrionic acids, chondrosintrionic acids, cellotriouronic acids and cellourotrionic acids.

28. The composition of claim 20, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of aldotetraonic acids, aldopentaonic acids, aldohexaonic acids, aldoheptaonic acids, aldooctaonic acids, aldononaonic acids, and aldodecaonic acids.

29. The composition of claim 20, wherein said cosmetic, pharmaceutical, or other topical agent is selected from the group consisting of agents that improve or eradicate age spots, keratoses and wrinkles; local analgesics and anesthetics; antiacne agents; antibacterials; antiyeast agents; antifungal agents; antiviral agents; antidandruff agents; antidermatitis agents; antihistamine agents; antipruritic agents; antiemetics; antimotion sickness agents; antiinflammatory agents; antihyperkeratolytic agents; antiperspirants; antipsoriatic agents; antiseborrheic agents; hair conditioners and hair treatment agents; antiaging and antiwrinkle agents; sunblock and sunscreen agents; skin lightening agents; depigmenting agents; vitamins; corticosteroids; tanning agents; hormones; retinoids; topical cardiovascular agents; hydroxyacids, ketoacids and related compounds; phenyl alpha acyloxyalkanoic acids and derivatives thereof; and N-acetyl-aldosamines, N-acetyl-amino acids and related N-acetyl compounds.

30. The composition of claim 20, wherein said cosmetic, pharmaceutical, or other topical agent is selected from the group consisting of aclovate, acyclovir, acetylsalicylic acid, adapalene, albuterol, aluminum acetate, aluminum chloride, aluminum hydroxide, aluminum chlorohydroxide, amantadine, aminacrine, aminobenzoic acid (PABA), aminocaproic acid, aminosalicilyc acid, amitriptyline, anthralin, ascorbic acid, ascoryl palimate, atropine, azelaic acid, bacitracin, bemegride, beclomethasone dipropionate, benzophenone, benzoyl peroxide, betamethasone dipropionate, betamethasone valerate, brompheniramine, bupivacaine, butoconazole, calcipotriene, camphor, capsaicin, carbamide peroxide, chitosan, chlorhexidine, chloroxylenol, chlorpheniramine, ciclopirox, clemastine, clindamycin, clioquinol, clobetasol propionate, clotrimazole, coal tar, cromolyn, crotamiton, cycloserine, dehydroepiandrosterone, desoximetasone, dexamethasone, diphenhydramine, doxypin, doxylamine, dyclonine, econazole, erythromycin, estradiol, ethinyl estradiol, fluocinonide, fluocinolone acetonide, 5-fluorouracil,

griseofulvin, guaifenesin, haloprogin, hexylresorcinol, homosalate, hydrocortisone, hydrocortisone 21-acetate, hydrocortisone 17-valerate, hydrocortisone 17-butyrate, hydrogen peroxide, hydroquinone, hydroquinone monoether, hydroxyzine, ibuprofen, ichthammol, imiquimod, indomethacin, ketoconazole, ketoprofen, kojic acid, lidocaine, meclizine, meclocycline, menthol, mepivacaine, methyl nicotinate, methyl salicylate, metronidazole, miconazole, minocycline, minoxidil, monobenzene, mupirocin, naftifine, naproxen, neomycin, nystatin, octyl methoxycinnamate, octyl salicylate, oxybenzone, oxiconazole, oxymetazoline, padimate O, permethrin, pheniramine, phenol, phenylephrine, phenylpropanolamine, piperonyl butoxide, podophyllin, podofilox, povidone iodine, pramoxine, prilocaine, procaine, promethazine propionate, propranolol, pseudoephedrine, pyrethrin, pyrilamine, resorcinol, retinal, 13-cis retinoic acid, retinoic acid, retinol, retinyl acetate, retinyl palmitate, salicylamide, salicylic acid, selenium sulfide, shale tar, sulconazole, sulfur, sulfadiazine, tazarotene, terbinafine, terconazole, tetracaine, tetracycline, tetrahydrozoline, thymol, tioconazole, tolnaftate, triamcinolone diacetate, triamcinolone acetonide, triamcinolone hexacetonide, triclosan, tripolidine, undecylenic acid, urea, vitamin E acetate, wood tar, zinc pyrithione, glycolic acid, lactic acid, methylactic acid, 4-hydroxy-mandelic acid, mandelic acid, gluconolactone, N-acetyl-glucosamine, N-acetyl-proline, phenyl 2-acetoxyethanoic acid and diphenyl 2-acetoxyethanoic acid.

31. The method of claim 10, wherein said composition further comprises a cosmetic, pharmaceutical, or other topical agent.

32. The method of claim 31, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof contains from 2 to 6 carbohydrate monomers.

33. The method of claim 31, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof contains from 2 to 3 carbohydrate monomers.

34. The method of claim 31, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof contains 2 carbohydrate monomers.

35. The method of claim 31, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of lactobionolactone, maltobionolactone, isomaltobionolactone, cellobionolactone, chitobionolactone, gentiobionolactone, glucobionolactone, galactobionolactone, mannobionolactone, ribobionolactone, kojibionolactone, xylobionolactone, arabinobionolactone, nigerobionolactone, laminarabinobionolactone, maltotriionolactone, isomaltotriionolactone, chitotriionolactone, cellotriionolactone, gentiotriionolactone, maltotetraonolactone, cellotetraonolactone, and chitotetraonolactone.

36. The method of claim 31, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of glycerbionic acids, erythrobionic acids, threobionic acids, ribobionic acids, arabinobionic acids, xylobionic acids, lyxobionic acids, allobionic acids, altrobionic acids, glucobionic

acids, mannobionic acids, gulobionic acids, idobionic acids, galactobionic acids, talobionic acids, alloheptobionic acids, althroheptobionic acids, glucoheptobionic acids, mannoheptobionic acids, guloheptobionic acids, idoheptobionic acids, galactoheptobionic acids, taloheptobionic acids, chitobionic acids, hyalobiouronic acids, hyalourobionic acids, chondrosines, chondrosinbionic acids, cellobiouronic acids, and cellourobionic acids.

37. The method of claim 36, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of isolactobionic acid, maltobionic acid, isomaltobionic acid, cellobionic acid, gentiobionic acid, laminarabionic acid, melibionic acid, nigerobionic acid, rutinobionic acid, sophorobionic acid, and kojibionic acid.

38. The method of claim 31, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of glycertrionic acids, erythrotrionic acids, threottrionic acids, ribottrionic acids, arabinottrionic acids, xylotrionic acids, lyxottrionic acids, allottrionic acids, altrottrionic acids, glucottrionic acids, mannottrionic acids, gulottrionic acids, idottrionic acids, galactottrionic acids, talottrionic acids, alloheptottrionic acids, althroheptottrionic acids, glucoheptottrionic acids, mannoheptottrionic acids, guloheptottrionic acids, idoheptottrionic acids, galactoheptottrionic acids, taloheptottrionic acids, chitottrionic acids, hyalotriouronic acids, hyalourottrionic acids, chondrosintrionic acids, cellotriouronic acids and cellourottrionic acids.

39. The method of claim 31, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of aldotetraonic acids, aldopentaonic acids, aldohexaonic acids, aldoheptaonic acids, aldooctaonic acids, aldononaonic acids, and aldodecaonic acids.

40. The method of claim 31, wherein said cosmetic conditions or dermatological disorders are selected from the group consisting of disturbed keratinization, defective syntheses of dermal components, and changes associated with aging of skin, nail and hair; and those indications which include dryness or loose of skin, nail and hair; xerosis; ichthyosis; palmar and plantar hyperkeratoses; uneven and rough surface of skin, nail and hair; dandruff; Darier's disease; lichen simplex chronicus; keratoses; acne; pseudofolliculitis barbae; eczema; psoriasis; itchy scalp and skin; pruritus; warts; herpes; age spots; lentigines; melasmas; blemished skin; hyperkeratoses; hyperpigmented skin; abnormal or diminished syntheses of collagen, glycosaminoglycans, proteoglycans and elastin as well as diminished levels of such components in the dermis; stretch marks; skin lines; fine lines; wrinkles; thinning of skin, nail plate and hair; skin thickening due to elastosis of photoaging, loss or reduction of skin, nail and hair resiliency, elasticity and recoilability; lack of skin, nail and hair lubricants and luster; dull and older-looking skin, nail and hair; and fragility and splitting of nail and hair.

41. The method of claim 31, wherein said cosmetic, pharmaceutical, or other topical agent is selected from the group consisting of agents that that improve or eradicate age spots, keratoses and wrinkles; local analgesics and anesthetics; antiacne agents; antibacterials; antiyeast agents; antifungal agents; antiviral agents; antidandruff agents; antidermatitis agents; antihistamine agents; antipruritic agents;

antiemetics; antinotion sickness agents; antiinflammatory agents; antihyperkeratolytic agents; antiperspirants; antipsoriatic agents; antiseborrheic agents; hair conditioners and hair treatment agents; antiaging and antiwrinkle agents; sunblock and sunscreen agents; skin lightening agents; depigmenting agents; vitamins; corticosteroids; tanning agents; hormones; retinoids; topical cardiovascular agents; hydroxyacids, ketoacids and related compounds; phenyl alpha acyloxyalkanoic acids and derivatives thereof; and N-acetyl-aldosamines, N-acetyl amino acids and related N-acetyl compounds.

42. The method of claim 31, wherein said cosmetic, pharmaceutical, or other topical agent is selected from the group consisting of aclovate, acyclovir, acetylsalicylic acid, adapalene, albuterol, aluminum acetate, aluminum chloride, aluminum hydroxide, aluminum chlorohydroxide, amantadine, aminacrine, aminobenzoic acid (PABA), aminocaproic acid, aminosalicic acid, amitriptyline, anthralin, ascorbic acid, ascoryl palimate, atropine, azelaic acid, bacitracin, bemegride, beclomethasone dipropionate, benzophenone, benzoyl peroxide, betamethasone dipropionate, betamethasone valerate, brompheniramine, bupivacaine, butoconazole, calcipotriene, camphor, capsaicin, carbamide peroxide, chitosan, chlorhexidine, chloroxylenol, chlorpheniramine, ciclopirox, clemastine, clindamycin, clioquinol, clobetasol propionate, clotrimazole, coal tar, cromolyn, crotamiton, cycloserine, dehydroepiandrosterone, desoximetasone, dexamethasone, diphenhydramine, doxypin, doxylamine, dyclonine, econazole, erythromycin, estradiol, ethinyl estradiol, fluocinonide, fluocinolone acetonide, 5-fluorouracil, griseofulvin, guaifenesin, haloprogin, hexylresorcinol, homosalate, hydrocortisone, hydrocortisone 21-acetate, hydrocortisone 17-valerate, hydrocortisone 17-butyrate, hydrogen peroxide, hydroquinone, hydroquinone monoether, hydroxyzine, ibuprofen, ichthammol, imiquimod, indomethacin, ketoconazole, ketoprofen, kojic acid, lidocaine, meclizine, meclocycline, menthol, mepivacaine, methyl nicotinate,



methly salicylate, metronidazole, miconazole, minocycline, minoxidil, monobenzene, mupirocin, naftifine, naproxen, neomycin, nystatin, octyl methoxycinnamate, octyl salicylate, oxybenzone, oxiconazole, oxymetazoline, padimate O, permethrin, pheniramine, phenol, phenylephrine, phenylpropanolamine, piperonyl butoxide, podophyllin, podofilox, povidone iodine, pramoxine, prilocaine, procaine, promethazine propionate, propranolol, pseudoephedrine, pyrethrin, pyrilamine, resorcinol, retinal, 13-cis retinoic acid, retinoic acid, retinol, retinyl acetate, retinyl palmitate, salicylamide, salicylic acid, selenium sulfide, shale tar, sulconazole, sulfur, sulfadiazine, tazarotene, terbinafine, terconazole, tetracaine, tetracycline, tetrahydrozoline, thymol, tioconazole, tolnaftate, triamcinolone diacetate, triamcinolone acetonide, triamcinolone hexacetonide, triclosan, triprolidine, undecylenic acid, urea, vitamin E acetate, wood tar, zinc pyrithione, glycolic acid, lactic acid, methylactic acid, 4-hydroxy-mandelic acid, mandelic acid, gluconolactone, N-acetyl-glucosamine, N-acetyl-proline, phenyl 2-acetoxyethanoic acid and diphenyl 2-acetoxyethanoic acid.

43. The composition of claim 1, further comprising an inorganic or organic alkali, or amphoteric.

44. The composition of claim 43, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof contains from 2 to 6 carbohydrate monomers.

45. The composition of claim 43, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof contains from 2 to 3 carbohydrate monomers.

46. The composition of claim 43, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof contains 2 carbohydrate monomers.

47. The composition of claim 43, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of lactobionolactone, maltobionolactone, isomaltobionolactone, cellobionolactone, chitobionolactone, gentiobionolactone, glucobionolactone, galactobionolactone, mannobionolactone, ribobionolactone, kojibionolactone, xylobionolactone, arabinobionolactone, nigerobionolactone, laminarabinobionolactone, maltotriionolactone, isomaltotriionolactone, chitotriionolactone, cellotriionolactone, gentiotriionolactone, maltotetraonolactone, cellotetraonolactone, and chitotetraonolactone.

48. The composition of claim 43, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of glycerbionic acids, erythrobionic acids, threobionic acids, ribobionic acids, arabinobionic acids, xylobionic acids, lyxobionic acids, allobionic acids, altrobionic acids, glucobionic acids, mannobionic acids, gulobionic acids, idobionic acids, galactobionic acids, talobionic acids, alloheptobionic acids, altroheptobionic acids, glucoheptobionic acids, mannoheptobionic acids, guloheptobionic acids, idoheptobionic acids, galactoheptobionic acids, taloheptobionic acids, chitobionic acids, hyalobiouronic

acids, hyalourobionic acids, chondrosines, chondrosinbionic acids, cellobiouronic acids, and cellourobionic acids.

49. The composition of claim 43, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of isolactobionic acid, maltobionic acid, isomaltobionic acid, cellobionic acid, gentiobionic acid, laminarabionic acid, melibionic acid, nigerobionic acid, rutinobionic acid, sophorobionic acid, and kojibionic acid.

50. The composition of claim 43, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of glycertrionic acids, erythrotrionic acids, threottrionic acids, ribottrionic acids, arabinottrionic acids, xylotrionic acids, lyxottrionic acids, allottrionic acids, altrottrionic acids, glucottrionic acids, mannottrionic acids, gulottrionic acids, idottrionic acids, galactottrionic acids, talottrionic acids, alloheptottrionic acids, altroheptottrionic acids, glucoheptottrionic acids, mannoheptottrionic acids, guloheptottrionic acids, idoheptottrionic acids, galactoheptottrionic acids, taloheptottrionic acids, chitottrionic acids, hyalotriouronic acids, hyalourotrionic acids, chondrosintrionic acids, cellotriouronic acids and cellourotrionic acids.

51. The composition of claim 43, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of aldotetraonic

acids, aldopentaonic acids, aldohexaonic acids, aldoheptaonic acids, aldooctaonic acids, aldonaonaonic acids, and aldodecaonic acids.

52. The composition of claim 43, wherein said inorganic alkali is selected from the group consisting of ammonium hydroxide, ammonium phosphate, ammonium carbonate, ammonium bicarbonate, sodium hydroxide, sodium carbonate, sodium bicarbonate, sodium acetate, sodium phosphate, and alkalis formed from potassium, calcium, magnesium, strontium, aluminum, zinc, and lithium.

53. The composition of claim 43, wherein said organic alkali is selected from the group consisting of amines, hydroxylamines, imines, guanidines, amine oxides, alkanolamines, alkoxyated amines, alkylamido alkylamines, organic amines, polyamines, hydroxylamines, amino acid esters, amino acid amides, aminosaccharides, aminoalditols, aminocyclitols, fattyamines, and imidazolines.

54. The composition of claim 43, wherein said organic alkali is selected from the group consisting of diethanolamine, triethanolamine, isopropanolamine, diisopropanolamine, triisopropanolamine, aminobutanol, aminoethyl propanediol, aminomethyl propanol, aminomethyl propanediol, isopropylamine, methylethanolamine, diisopropylamine, dipropylenetriamine, glucamine, N-methylglucamine, morpholine, tromethamine, cocamines, soyamines, oleamines, stearamines, quaterniums, creatinine, glycine ethyl ester, arginine ethyl ester, lysine methyl ester, proline ethyl ester, citrulline benzyl ester, glycinamide, argininamide, prolinamide, lysinamide, glucamine, methylglucamine, glucosamines and glucosylamines, other glycosamines and glycosylamines, aminoinositols, chitosan, stearamidoethyl diethylamine, stearamidopropyl dimethylamine, stearamidoethyl diethanolamine, and quaternary ammonium hydroxide.

55. The composition of claim 43, wherein said amphoteric is selected from the group consisting of amino acids, peptides, polypeptides, proteins and related compounds.

56. The composition of claim 43, wherein said amphoteric is selected from the group consisting of glycine, arginine, lysine, cysteine, proline, glutamine, histidine, asparagine, tyrosine, ornithine, citrulline, creatine, creatinine, and tryptophan.

57. The method of claim 10, wherein said composition further comprises an inorganic or organic alkali, or amphoteric substance.

58. The method of claim 57, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof contains from 2 to 6 carbohydrate monomers.

59. The method of claim 57, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof contains from 2 to 3 carbohydrate monomers.

60. The method of claim 57, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof contains 2 carbohydrate monomers.

61. The method of claim 57, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of lactobionolactone, maltobionolactone, isomaltobionolactone, cellobionolactone, chitobionolactone, gentiobionolactone, glucobionolactone, galactobionolactone, mannobionolactone, ribobionolactone, kojibionolactone, xylobionolactone, arabinobionolactone, nigerobionolactone, laminarabinobionolactone, maltotriionolactone, isomaltotriionolactone, chitotriionolactone, cellotriionolactone, gentiotriionolactone, maltotetraonolactone, cellotetraonolactone, and chitotetraonolactone.

62. The method of claim 57, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of glycerbionic acids, erythrobionic acids, threobionic acids, ribobionic acids, arabinobionic acids, xylobionic acids, lyxobionic acids, allobionic acids, altrobionic acids, glucobionic acids, mannobionic acids, gulobionic acids, idobionic acids, galactobionic acids, talobionic acids, alloheptobionic acids, altroheptobionic acids, glucoheptobionic acids, mannoheptobionic acids, guloheptobionic acids, idoheptobionic acids, galactoheptobionic acids, taloheptobionic acids, chitobionic acids, hyalobiouronic acids, hyalourobionic acids, chondrosines, chondrosinbionic acids, cellobiouronic acids, and cellourobionic acids.

63. The method of claim 57, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of isolactobionic acid,

maltobionic acid, isomaltobionic acid, cellobionic acid, gentiobionic acid, laminarabionic acid, melibionic acid, nigerobionic acid, rutinobionic acid, sophorobionic acid, and kojibionic acid.

64. The method of claim 57, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of glycertrionic acids, erythrotrionic acids, threottrionic acids, ribottrionic acids, arabinottrionic acids, xylottrionic acids, lyxottrionic acids, allottrionic acids, altrottrionic acids, glucottrionic acids, mannottrionic acids, gulottrionic acids, idottrionic acids, galactottrionic acids, talottrionic acids, alloheptottrionic acids, altroheptottrionic acids, glucoheptottrionic acids, mannoheptottrionic acids, guloheptottrionic acids, idoheptottrionic acids, galactoheptottrionic acids, taloheptottrionic acids, chitottrionic acids, hyalotriouronic acids, hyalourotrionic acids, chondrosintrionic acids, cellotriouronic acids and cellourotrionic acids.

65. The method of claim 57, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of aldotetraonic acids, aldopentaonic acids, aldohexaonic acids, aldoheptaonic acids, aldooctaonic acids, aldonnaonic acids, and aldodecaonic acids.

66. The method of claim 57, wherein said inorganic alkali is selected from the group consisting of ammonium hydroxide, ammonium phosphate, ammonium carbonate, ammonium bicarbonate, sodium hydroxide, sodium carbonate, sodium bicarbonate, sodium acetate, sodium phosphate, and alkalis

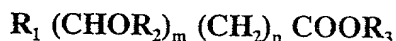




glutamine, asparagine, tyrosine, ornithine, citrulline, creatine, histidine, creatinine, canavanine, and tryptophan.

71. A method for general care or treatment or prevention of diseases or conditions of the oral or vaginal mucosa or for treating skin wounds, comprising topically applying a composition comprising (A) a topically acceptable vehicle or base and (B) at least one compound selected from the group consisting of oligosaccharide aldonic acids and related compounds, and isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, and straight or branched chain, or cyclic forms thereof,

wherein said oligosaccharide aldonic acid has the formula:



wherein,

$R_1$  and  $R_3$  are independently H or an alkyl, aralkyl or aryl group of saturated or unsaturated, straight or branched chain or cyclic form, having from 1 to 25 carbon atoms;

$m$  is 2, 3, 4, 5, 6, 7, 8, 9, 10 or 11;

$n$  is 0, 1, 2, 3, 4, 5, 6, 7, 8, or 9;

$R_2$  is independently selected from the group consisting of H and any carbohydrate having 1 to 9 monomers, wherein at least one  $R_2$  is a carbohydrate;

H attached to carbon atom is optionally substituted by I, F, Cl, Br,  $NH_2$ ,  $NHCOCH_3$ , SH, or an alkyl, alkoxyl, aralkyl or aryl group of saturated or unsaturated, straight or branched chain or cyclic form, having 1 to 9 carbon atoms;

$R_1$ ,  $R_2$ ,  $OR_2$  or H optionally carry or are optionally substituted with CHO, COOH, sulfate, phosphate, nitrate, or a lower alkoxyl having 1 to 5 carbon atoms; and

H of the OH group is optionally substituted by an acyl group having from 2 to 25 carbon atoms.

72. The method of claim 71, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof contains from 2 to 6 carbohydrate monomers.

73. The method of claim 71, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof contains from 2 to 3 carbohydrate monomers.

74. The method of claim 71, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof contains 2 carbohydrate monomers.

75. The method of claim 71, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of lactobionolactone, maltobionolactone, isomaltobionolactone, cellobionolactone, chitobionolactone, gentiobionolactone, glucobionolactone, galactobionolactone, mannobionolactone, ribobionolactone, kojibionolactone, xylobionolactone, arabinobionolactone, nigerobionolactone, laminarabinobionolactone, maltotrionolactone, isomaltotrionolactone, chitotrionolactone, cellotrionolactone, gentiotrionolactone, maltotetraonolactone, cellotetraonolactone, and chitotetraonolactone.

76. The method of claim 71, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of glycerbionic acids, erythrobionic acids, threobionic acids, ribobionic acids, arabinobionic acids, xylobionic acids, lyxobionic acids, allobionic acids, altrobionic acids, glucobionic acids, mannobionic acids, gulobionic acids, idobionic acids, galactobionic acids, talobionic acids, alloheptobionic acids, altoheptobionic acids, glucoheptobionic acids, mannoheptobionic acids, guloheptobionic acids, idoheptobionic acids, galactoheptobionic acids, taloheptobionic acids, chitobionic acids, hyalobiouronic acids, hyalourobionic acids, chondrosines, chondrosinbionic acids, cellobiouronic acids, and cellourobionic acids.

77. The method of claim 76, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of lactobionic acid, isolactobionic acid, maltobionic acid, isomaltobionic acid, cellobionic acid, gentiobionic acid, laminarabionic acid, melibionic acid, nigerobionic acid, rutinobionic acid, sophorobionic acid, and kojibionic acid.

78. The method of claim 71, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of glycertrionic acids, erythrotrionic acids, threottrionic acids, ribottrionic acids, arabinottrionic acids, xylotrionic acids, lyxottrionic acids, allottrionic acids, altrottrionic acids, glucottrionic acids, mannottrionic acids, gulottrionic acids, idottrionic acids, galactottrionic acids,

talotronic acids, alloheptotronic acids, altoheptotronic acids, glucoheptotronic acids, mannoheptotronic acids, guloheptotronic acids, idoheptotronic acids, galactoheptotronic acids, taloheptotronic acids, chitotronic acids, hyalotriouronic acids, hyalourotrionic acids, chondrosintrionic acids, cellotriouronic acids and cellourotrionic acids.

79. The method of claim 71, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of aldotetraonic acids, aldopentaonic acids, aldohexaonic acids, aldoheptaonic acids, aldooctaonic acids, aldononaonic acids, and aldodecaonic acids.

80. The method of claim 71, wherein said skin wounds are selected from the group consisting of skin cuts, tears, lacerations, burns, and punctures.

81. The method of claim 71, wherein said composition further comprises a cosmetic, pharmaceutical, or other topical agent.

82. The method of claim 81, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof contains from 2 to 6 carbohydrate monomers.

83. The method of claim 81, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof contains from 2 to 3 carbohydrate monomers.

84. The method of claim 81, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof contains 2 carbohydrate monomers.

85. The method of claim 81, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of lactobionolactone, maltobionolactone, isomaltobionolactone, cellobionolactone, chitobionolactone, gentiobionolactone, glucobionolactone, galactobionolactone, mannobionolactone, ribobionolactone, kojibionolactone, xylobionolactone, arabinobionolactone, nigerobionolactone, laminarabinobionolactone, maltotrionolactone, isomaltotrionolactone, chitotrionolactone, cellottrionolactone, gentiotrionolactone, maltotetraonolactone, cellotetraonolactone, and chitotetraonolactone.

86. The method of claim 81, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of glycerbionic acids, erythrobionic acids, threobionic acids, ribobionic acids, arabinobionic acids, xylobionic acids, lyxobionic acids, allobionic acids, altrobionic acids, glucobionic acids, mannobionic acids, gulobionic acids, idobionic acids, galactobionic acids, talobionic acids, alloheptobionic acids, altroheptobionic acids, glucoheptobionic acids, mannoheptobionic acids, guloheptobionic acids, idoheptobionic acids, galactoheptobionic acids, taloheptobionic acids, chitobionic acids, hyalobiouronic

acids, hyalourobionic acids, chondrosines, chondrosinbionic acids, cellobiouronic acids, and cellourobionic acids.

87. The method of claim 86, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of lactobionic acid, isolactobionic acid, maltobionic acid, isomaltobionic acid, cellobionic acid, gentiobionic acid, laminarabionic acid, melibionic acid, nigerobionic acid, rutinobionic acid, sophorobionic acid, and kojibionic acid.

88. The method of claim 81, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of glycertrionic acids, erythrotrionic acids, threottrionic acids, ribottrionic acids, arabinottrionic acids, xylotrionic acids, lyxottrionic acids, allottrionic acids, altrottrionic acids, glucottrionic acids, mannottrionic acids, gulottrionic acids, idottrionic acids, galactottrionic acids, talottrionic acids, alloheptottrionic acids, altoheptottrionic acids, glucoheptottrionic acids, mannoheptottrionic acids, guloheptottrionic acids, idoheptottrionic acids, galactoheptottrionic acids, taloheptottrionic acids, chitottrionic acids, hyalotriouronic acids, hyalourotrionic acids, chondrosintrionic acids, cellotriouronic acids and cellourotrionic acids.

89. The method of claim 81, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of aldotetraonic acids,

aldopentaonic acids, aldohexaonic acids, aldoheptaonic acids, aldooctaonic acids, aldononaonic acids, and aldodecaonic acids.

90. The method of claim 81, wherein said skin wounds are selected from the group consisting of skin cuts, tears, lacerations, burns, and punctures.

91. The method of claim 71, wherein said composition further comprises an inorganic or organic alkali, or amphoteric.

92. The method of claim 91, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof contains from 2 to 6 carbohydrate monomers.

93. The method of claim 91, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof contains from 2 to 3 carbohydrate monomers.

94. The method of claim 91, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof contains 2 carbohydrate monomers.

95. The method of claim 91, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of lactobionolactone,

maltobionolactone, isomaltobionolactone, cellobionolactone, chitobionolactone, gentiobionolactone, glucobionolactone, galactobionolactone, mannobionolactone, ribobionolactone, kojibionolactone, xylobionolactone, arabinobionolactone, nigerobionolactone, laminarabinobionolactone, maltotrionolactone, isomaltotrionolactone, chitotrionolactone, cellotrionolactone, gentiotrionolactone, maltotetraonolactone, cellotetraonolactone, and chitotetraonolactone.

96. The method of claim 91, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of glycerbionic acids, erythrobionic acids, threobionic acids, ribobionic acids, arabinobionic acids, xylobionic acids, lyxobionic acids, allobionic acids, altrobionic acids, glucobionic acids, mannobionic acids, gulobionic acids, idobionic acids, galactobionic acids, talobionic acids, alloheptobionic acids, altroheptobionic acids, glucoheptobionic acids, mannoheptobionic acids, guloheptobionic acids, idoheptobionic acids, galactoheptobionic acids, taloheptobionic acids, chitobionic acids, hyalobiouronic acids, hyalourobionic acids, chondrosines, chondrosinbionic acids, cellobiouronic acids, and cellourobionic acids.

97. The method of claim 91, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of lactobionic acid, isolactobionic acid, maltobionic acid, isomaltobionic acid, cellobionic acid, gentiobionic acid, laminarabionic acid, melibionic acid, nigerobionic acid, rutinobionic acid, sophorobionic acid, and kojibionic acid.



98. The method of claim 91, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of glycertrionic acids, erythrotrionic acids, threottrionic acids, ribottrionic acids, arabinottrionic acids, xylotrionic acids, lyxottrionic acids, allottrionic acids, altrottrionic acids, glucottrionic acids, mannottrionic acids, gulottrionic acids, idottrionic acids, galactottrionic acids, talottrionic acids, alloheptottrionic acids, altroheptottrionic acids, glucoheptottrionic acids, mannoheptottrionic acids, guloheptottrionic acids, idoheptottrionic acids, galactoheptottrionic acids, taloheptottrionic acids, chitottrionic acids, hyalotriouronic acids, hyalourotrionic acids, chondrosintrionic acids, cellotriouronic acids and cellourotrionic acids.

99. The method of claim 91, wherein said oligosaccharaide aldonic acid or related compound, or isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, straight or branched chain, or cyclic form thereof is at least one member selected from the group consisting of aldotetraonic acids, aldopentaonic acids, aldohexaonic acids, aldoheptaonic acids, aldooctaonic acids, aldononaonic acids, and aldodecaonic acids.

100. The method of claim 91, wherein said inorganic alkali is selected from the group consisting of ammonium hydroxide, ammonium phosphate, ammonium carbonate, ammonium bicarbonate, sodium hydroxide, sodium carbonate, sodium bicarbonate, sodium acetate, sodium phosphate, and alkalis formed from potassium, calcium, magnesium, strontium, aluminum, zinc, and lithium.

101. The method of claim 91, wherein said organic alkali is selected from the group consisting of amines, hydroxylamines, imines, guanidines, amine oxides, alkanolamines, alkoxylated amines, alkylamido alkylamines, organic amines, polyamines, hydroxylamines, amino acid esters, amino acid amides, aminosaccharides, aminoalditols, aminocyclitols, fattyamines, and imidazolines.

102. The method of claim 91, wherein said organic alkali is selected from the group consisting of diethanolamine, triethanolamine, isopropanolamine, diisopropanolamine, triisopropanolamine, aminobutanol, aminoethyl propanediol, aminomethyl propanol, aminomethyl propanediol, isopropylamine, methylethanolamine, diisopropylamine, dipropylenetriamine, glucamine, N-methylglucamine, morpholine, tromethamine, cocamines, soyamines, oleamines, stearamines, quaterniums, creatinine, glycine ethyl ester, arginine ethyl ester, lysine methyl ester, proline ethyl ester, citrulline benzyl ester, glycinamide, argininamide, prolinamide, lysinamide, glucamine, methylglucamine, glucosamines and glucosylamines, other glycosamines and glycosylamines, aminoinositols, chitosan, stearamidoethyl diethylamine, stearamidopropyl dimethylamine, stearamidoethyl diethanolamine, and quaternary ammonium hydroxide.

103. The method of claim 91, wherein said amphoteric is selected from the group consisting of amino acids, peptides, polypeptides, proteins and related compounds.

104. The method of claim 91, wherein said amphoteric is selected from the group consisting of glycine, arginine, lysine, cysteine, proline, glutamine, asparagine, tyrosine, ornithine, citrulline, creatine, histidine, canavanine, and tryptophan.

105. A method of using lactobionic acid for general treatment of skin and nail and topical treatment or prevention of cosmetic conditions or dermatological disorders selected from the indications consisting of dryness of skin, nail and hair; xerosis; ichthyosis; palmar and plantar hyperkeratoses; uneven and rough surface of skin, nail and hair; dandruff; Darier's disease; lichen simplex chronicus; keratoses; acne; pseudofolliculitis barbae; eczema; psoriasis; pruritus; warts; herpes; age spots; lentigines; melasmas; blemished skin; mottled skin; hyperkeratoses; hyperpigmented skin; stretch marks; thinning of nail plate and hair; fragility and splitting of nail and hair; wound-healing and treatment of skin wounds; general care as well as treatment and prevention of diseases and conditions of oral, gum and vaginal mucosa.

106. The method of claim 105, further comprising a cosmetic, pharmaceutical, or other topical agent selected from the group consisting of local analgesics and anesthetics; antibacterials; antiyeast agents; antifungal agents; antiviral agents; antidandruff agents; antidermatitis agents; antihistamine agents; antipruritic agents; antiemetics; antmotion sickness agents; antiinflammatory agents; antihyperkeratolytic agents; antiperspirants; antipsoriatic agents; antiseborrheic agents; vitamins; corticosteroids; tanning agents; hormones; retinoids; wound healing agents; oral and vaginal care or treatment agents; gum disease treatment or care agents; hydroxyacids, ketoacids and related compounds; phenyl alpha acyloxyalkanoic acids and derivatives thereof; and N-acetylalidosamines, N-acetylalmino acids and related N-acetyl compounds.

107. The method of claim 106, wherein said cosmetic, pharmaceutical, or other topical agent is selected from the group consisting of aclovate, acyclovir, acetylsalicylic acid, adapalene, albuterol, aluminum acetate, aluminum chloride, aluminum hydroxide, aluminum chlorohydroxide, amantadine, aminacrine;

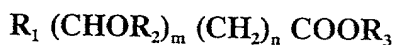
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acid, 4-hydroxy-mandelic acid, gluconolactone, N-acetyl-glucosamine, N-acetyl-proline, phenyl 2-acetoxyethanoic acid and diphenyl 2-acetoxyethanoic acid.

108. The method claim 105, wherein said lactobionic acid is free acid, ester, salt, partial salt or lactone.

109. A method of forming on the skin, hair, nail or mucosa a gel matrix comprising applying to the the skin, hair, nail or mucosa at least one compound selected from the group consisting of oligosaccharaide aldonic acids and related compounds, and isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, and straight or branched chain, or cyclic forms thereof,

wherein said oligosaccharide aldonic acid has the formula:



wherein,

$R_1$  and  $R_3$  are independently H or an alkyl, aralkyl or aryl group of saturated or unsaturated, straight or branched chain or cyclic form, having from 1 to 25 carbon atoms;

$m$  is 2, 3, 4, 5, 6, 7, 8, 9, 10 or 11;

$n$  is 0, 1, 2, 3, 4, 5, 6, 7, 8, or 9;

$R_2$  is independently selected from the group consisting of H and any carbohydrate having 1 to 9 monomers, wherein at least one  $R_2$  is a carbohydrate;

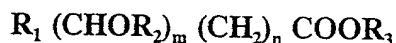
H attached to carbon atom is optionally substituted by I, F, Cl, Br,  $NH_2$ ,  $NHCOCH_3$ , SH, or an alkyl, alkoxyl, aralkyl or aryl group of saturated or unsaturated, straight or branched chain or cyclic form, having 1 to 9 carbon atoms;

$R_1$ ,  $R_2$ ,  $OR_2$  or H optionally carry or are optionally substituted with CHO, COOH, sulfate, phosphate, nitrate, or a lower alkoxyl having 1 to 5 carbon atoms; and

H of the OH group is optionally substituted by an acyl group having from 2 to 25 carbon atoms.

110. An antioxidant comprising (A) an acceptable vehicle or base and (B) at least one compound selected from the group consisting of oligosaccharaide aldonic acids and related compounds, and isomeric or nonisomeric, free acid, ester, salt, partial salt, lactone, saturated or unsaturated, and straight or branched chain, or cyclic forms thereof,

wherein said oligosaccharide aldonic acid has the formula:



wherein,

$R_1$  and  $R_3$  are independently H or an alkyl, aralkyl or aryl group of saturated or unsaturated, straight or branched chain or cyclic form, having from 1 to 25 carbon atoms;

$m$  is 2, 3, 4, 5, 6, 7, 8, 9, 10 or 11;

$n$  is 0, 1, 2, 3, 4, 5, 6, 7, 8, or 9;

$R_2$  is independently selected from the group consisting of H and any carbohydrate having 1 to 9 monomers, wherein at least one  $R_2$  is a carbohydrate;

H attached to carbon atom is optionally substituted by I, F, Cl, Br,  $NH_2$ ,  $NHCOCH_3$ , SH, or an alkyl, alkoxyl, aralkyl or aryl group of saturated or unsaturated, straight or branched chain or cyclic form, having 1 to 9 carbon atoms;

$R_1$ ,  $R_2$ ,  $OR_2$  or H optionally carry or are optionally substituted with CHO, COOH, sulfate, phosphate, nitrate, or a lower alkoxyl having 1 to 5 carbon atoms; and

H of the OH group is optionally substituted by an acyl group having from 2 to 25 carbon atoms.